
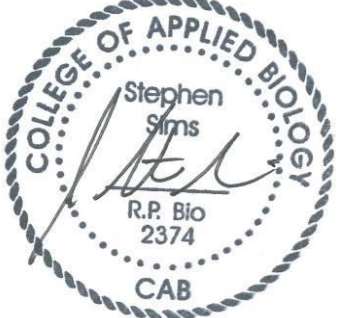


Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #108

Reporting Period: November 20 – December 3, 2016

Upper Lillooet River Hydroelectric Facility (Water File No. 2002561, Water Licence No. C130613), Boulder Creek Hydroelectric Facility (Water File No. 2003049, Water Licence No. C129969) & Transmission Line (TX Line)

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		<p>Date Prepared: June 26, 2017 Date Submitted: August 15, 2017</p>

Owner Construction Permits and Approvals

Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4, 5, 6, 7)
Fisheries Act Subsection 35(2)(b) Authorization No. 09-HPAC-PA2-000303 (Amendment 1, 2)
Letter of Advice for the Transmission Line No. 09-HPAC0-PA2-000303
Leave To Commence Construction (ULRHEF) File No. 2002561
Leave To Commence Construction (BDRHEF) File No. 2002453
Leave To Commence Construction (TX Line) File No. 2002561/2002453
Conditional Water Licence (ULRHEF C130613) File No. 2002561
Conditional Water Licence (BDRHEF C129969) File No. 2002453
Conditional Water Licence (BDRHEF C131153) File No. 2003601
Licence of Occupation & Modification Agreement (ULRHEF #232384) File No. 2409871
Licence of Occupation (BDRHEF #232386) File No. 2409998
Licence of Occupation (TX Line #2423386) File No. 2410654
Occupant Licence to Cut (ULRHEF) No. L49717(Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
Occupant Licence to Cut (BDRHEF – KM38 laydown) No. L49698
Occupant Licence to Cut (BDRHEF) No. L49816 (Amendments 1, 2, 3)
Occupant Licence to Cut (TX Line) No. L49697 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9)
General Wildlife Measure Exemption Approval Letter (TX Line & BDRHEF) File No. 78700-35/06 UWR and 39585-20 WHA
Heritage Conservation Act – Alteration Permit (ULRHEF) File No. 11200-03/2014-0033
Road Use Permit No. 6123-13-02 (Lillooet River FSR); 5673-13-01 (Rutherford Creek FSR); 7977-13-01 (Lillooet South FSR); 8015-13-01 (Ryan River); 8188-13-01 (Pemberton Creek FSR); and 9717-13-01 (Miller Bench FSR)
Junction Permit (ULRHEF & BDRHEF) File No. 11250-32/6123 (Amendment 1)
Aeronautical Obstruction Approval (Tx Line - Lillooet River Crossing) File No. 2013-004
Aeronautical Obstruction Approval (Tx Line - Ryan River) File No. 2013-005
Aeronautical Obstruction Approval (Tx Line - North Miller) File No. 2013-006
Aeronautical Obstruction Approval (Tx Line - South Miller) File No. 2013-007
Aeronautical Obstruction Approval (Tx Line - Pemberton Creek) File No. 2013-008
Aeronautical Obstruction Approval (Tx Line - Lillooet River near Pemberton) File No. 2013-009
Aeronautical Obstruction Approval (Tx Line - Lillooet River near Meager Creek) File No. 2013-010
Navigable Water Protection Act (ULRHEF) File No. 8200-2009-500434-001
Navigable Water Protection Act (BDRHEF) File No. 8200-2012-501-032-001
Navigable Water Protection Act (Tx Line – North Creek) File No. 8200-2013-500103-001
Navigable Water Protection Act (Tx Line – Lillooet River) File No. 8200-2013-500101-001
Navigable Water Protection Act (Tx Line – Lillooet River) File No. 8200-2013-500102-01
Navigable Water Protection Act (Tx Line – Ryan River) File No. 8200-2013-500104-001
Navigable Water Protection Act (Tx Line – South Miller River) File No. 8200-2013-500100-001
Navigable Water Protection Act (Tx Line – Boulder Creek) File No. 8200-2013-500099-001
Navigable Water Protection Act – Extension Approval (ULRHEF, BDRHEF, Tx Line)
Navigable Water Protection Act (Bridge – Ryan River) File No. 8200-2013-500381
Navigable Water Protection Act (Bridge – Upper Lillooet Side Channel; Extension Approval) File No. 8200-2013-500383
Section 57 Authorization (ULRHEF) File No. 16660-20/REC202717
SLRD Temporary Use Permit No. 34 – Boulder Creek HEF
SLRD Temporary Use Permit No. 35 – Upper Lillooet River HEF
SLRD Building Permit (10864) – Upper Lillooet River HEF Powerhouse
SLRD Building Permit (10865) – Boulder Creek HEF Powerhouse
Works Permit for Construction within FSR Right-of-Way No. 6123-14-01
Works Permit for Construction within FSR Right-of-Way No. 7977-15-01
Section 52(1)(b) FRPA Authorization for Ryan River Wet Crossing File No. FOR-19400-01/2014
MOTI Permit to Construct, Use and Maintain Works Upon the Right-Of-Way of a Provincial Public Highway No. 2014-06099
Magazine Licence File No. UL76018 (Renewal 1)
Section 8 Approval – Short Term Use of Water File (Lillooet River and Tributaries) No. A2006123 (Amendment 1)
Section 8 - Special Use Permit issued for the operation of an avalanche weather station on Crown land (File No. S25988)
Special Use Permit issued for construction of the Lillooet River FSR 48km bypass road on Crown land (File No. S26115)

Contractor Construction Permits and Approvals

Waste Discharge under the Code of Practice for the Concrete and Concrete Products Industry under the Environmental Management Act (Authorization No. 107204) Tracking No. 349424 (Renewal 2)
Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU15-164805; Fish Salvage Permit # SU15-174722
Fisheries and Oceans Canada – Anadromous Fish Salvage Permit #XR 178 2015
BC Safety Authority – Temporary Construction Electrical Service Permit EL-140698-2014
Municipal Wastewater Regulation - Authorization # 107032
Water Supply System Construction Permits – VCH-14-613 for Main Camp
Water Supply System Permit to Operate Issued July 30th, 2014 for Main Camp
Section 6(3) and Schedule 3 Wildfire Regulations Fire Exemption for Ryan River Bridge File No. 14350-07
SLRD Building Inspection Report dated August 13, 2014 - Construction Camp Building Permit No. 10830
Lillooet River FSR Temporary Road Closures Approval File No. 11250-32/6123 (Amendment 1, 2)
Lillooet South FSR Temporary Road Closures Approval File No. 11250-32/7977
SLRD Building Permits for Mechanic Shop (10862) and Carpentry Shop (10836) March 18, 2015
SLRD Building Permit Stages 1 - 4 – Boulder Powerhouse Architectural, Electrical and Mechanical (10865) October 8, 2015
SLRD Building Permit Stages 1 - 4 – Upper Lillooet Powerhouse Architectural and Mechanical (10864) October 6, 2015
Water Sustainability Act Section 10(1) Use Approval dated March 24, 2016
Section 7 Explosives Act – Magazine Licence (U76018) Renewal April 30, 2016

ACRONYMS:

AMBNS	Active Migratory Bird Nesting Survey	HWM	High water mark
Andritz	Andritz Hydro Canada Inc.	IE	Independent Engineer (True North Energy)
ANFO	Ammonia nitrate fuel oil (industrial explosive)	IEM	Independent Environmental Monitor
ARD M/L	Acid Rock Drainage and Metal Leaching	INX	Innergex Renewable Energy Inc.
BCEAO	British Columbia Environmental Assessment Office	ISW	Instream Works
BCCOS	British Columbia Conservation Officer Service	ITM	Environmental Issue Tracking Matrix
BCWQG	British Columbia Water Quality Guidelines	JEM	JEM Energy Ltd. (Delegate Independent Engineer)
BDRHEF	Boulder Creek Hydroelectric Facility	LTC	Leave to Construct
BEBO	ULRHEF Intake Concrete Arch & Foundation Wall	MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
BG	Background	MOE	Ministry of Environment
BKL	BKL Consultants Ltd.	MOTI	Ministry of Transportation and Infrastructure
CE	CRT-ebc Construction Inc.	OGMA	Old Growth Management Area
CEMP	Construction Environmental Management Plan	OLTC	Occupational License to Cut
CTF	Coastal Tailed Frog	PAG	Potentially Acid Generating
DFO	Fisheries and Oceans Canada	QP	Qualified Professional
DS	Downstream	ROW	Right of Way
EPP	Environmental Protection Plan	RVMA	Riparian Vegetation Management Area
EAC	Environmental Assessment Certificate	SES	Sartori Environmental Services
EAO	Environmental Assessment Office	SLRD	Squamish-Lillooet Regional District
Ecofish	Ecofish Research Ltd.	TX Line	Transmission Line
Ecologic	Ecologic Consulting	ULRHEF	Upper Lillooet Hydroelectric Facility
EIR	Environmental Incident Report	UWR	Ungulate Winter Range
ESC	Erosion and Sediment Control	VC	Valued Component
FAM	Field Advice Memorandum	WEL	Westpark Electric Ltd.
FSR	Forest Service Road	WEMR	Weekly Environmental Monitoring Report
Golder	Golder Associates	WHA	Wildlife Habitat Area
GWR	Mountain Goat Winter Range		
Hedberg	Hedberg and Associates Ltd.		

1.0 Summary of Site Inspections for Reporting Period

The table presented below summarizes the IEM team site presence, weather and monitoring locations by component:

Date	IEM Team Personnel	Key Monitoring Locations & Activities
November 20 – 26, 2016	SE, MC, TH, AS, SS	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance and snow plowing on the Lillooet River FSR • Raising the elevation of the Lillooet River FSR between KM41.5 – 42.25 • Stream 9 repair works – Realignment of creek • Danger tree assessment along the Lillooet River FSR and all work site access roads. • KM41.7 PAG spoil capping and reclamation <p>ULRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Repair works on the Obermeyer weir • Intake road deactivation and removal of water treatment pipes • Mechanical commissioning works • Removing shoring in the BEBO tunnel • Handrail installation • Radar Sensor installation <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Completion of injection grouting on night shift • Demobilization from site (removal of oil/water separator) <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Sandblasting and painting works • Pulling conduit along penstock • Penstock repair near downstream portal • Penstock flushing <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Mechanical and electrical works • Superstructure deficiency corrections • Westpark switchyard works • Cleaning draft tubes # 3 and 4 • Second stage concrete works <p>BDRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Electrical works inside the control room • Installation of intake gate heating system <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Rocktrap excavation, support, rebar, formwork and concrete works • Tunnel plug injection grouting completed • Backfill injection and grout port welding <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Electrical works inside powerhouse • Switch yard works • Bifurcation rebar, formwork and concrete works <p>TX Line</p> <p>Segment 1</p> <ul style="list-style-type: none"> • Switch yard works • Removal of stringer line <p>Segment 2</p> <ul style="list-style-type: none"> • Removal of stringer line • Hazard tree falling • Switch yard works

		Segment 14 <ul style="list-style-type: none"> • Clearing of hazard trees within approach limits
November 27 – December 3, 2016	AS, MC	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance and snow plowing on the Lillooet River FSR • KM41.7 PAG spoil capping and reclamation • KM48 re-opened access to pull box <p>ULRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Electrical works • Drilling, concrete pours and installation of fence and fence posts • Mechanical commissioning works • Obermeyer dry commissioning • Snow removal <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Penstock repair <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • Truckwash Creek over-drain repair <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Mechanical and electrical works • Superstructure deficiency corrections • Westpark switchyard works • Second stage concrete works <p>BDRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Construction works complete; commissioning works only <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Rocktrap excavation, support, rebar, formwork and concrete works • Tunnel Plug- formwork, rebar, stand pipes, and void pipes. <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Electrical work • Switch yard works • Bifurcation rebar, formwork and concrete works <p>TX-Line</p> <p>Segment 1</p> <ul style="list-style-type: none"> • Working on Tap <p>Segment 2</p> <ul style="list-style-type: none"> • Working on Tap <p>Segment 16</p> <ul style="list-style-type: none"> • Pulling fiber

IEM Team Personnel: TH – Tom Hicks; SE – Stephanie Ellis; MC – Mike Champion; AS – Anne Sutherland; SS – Stephen Sims

2.0 Administrative Summary

Key communications and meetings the IEM team had with the licensees, contractors and/or environmental authorities:

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
November 23	Email	INX, SES, CE, JEM, True North	The IE and IEM received notification from INX that all construction activities at the BDRHEF intake are now complete and commissioning activities are all that remain. Dry commissioning will continue at the BDRHEF intake over the winter months with wet commissioning activities to occur in 2017.	-
November 24	Email	SES, CE, INX	RE: EIR#33 – work in flowing water without IEM notification or supervision – The IEM requested that CE provide an incident report describing how and when the culverts at KM41.7 were installed and to provide details on the specific BMPs were used to ensure water quality. The IEM stressed that the culverts were installed in a ditch line that has direct connection to the Lillooet River. Additionally, the IEM reminded CE that any works in or near flowing water require 48-hours notification and the presence of the IEM prior to works commencing.	EIR #033
November 25	Email	INX, SES	RE: ULHP Snow Plowing – UWR & Trapper Areas – INX requested that the IEM monitor road clearing activities and ensure that crews are plowing ungulate escape routes at 100 m intervals and that all pull out areas are ploughed to allow the trapper to safely and fully pull off the FSR.	-
	Site discussion	SES, CE	The IEM informed CE that they witnessed four vehicles drive through the mountain goat migration corridor during the both the sunrise and sunset daily operational shutdown. The IEM requested that CE ensure that all crew member are aware that no traffic is allowed to pass through the Truckwash Creek migration corridor during the two operational shutdowns. Additionally, the IEM requested that CE prepare an environmental incident for these two violations.	EIR #034
November 27	Email	SES, INX, CE	RE: EIR #033 and #034 – The IEM provided INX with the final version of EIR#033 (Working in flowing water without notifying or the supervision of the IEM) and EIR#034 (Failure to adhere to the daily operational shutdown for mountain goat migration).	EIR #033 and #034
November 30	Email	CE, SES, INX	CE informed the IEM and INX that crews would start installing the buried conduit over drains today, and requested that the IEM attend a kick off meeting on site to discuss any environmental concerns.	-
	Pre-work meeting and site discussion	CE, SES, INX	A pre-work meeting was held for the construction of drainage features over the buried conduit (under the transmission line) from the BDRHEF powerhouse to the BDRHEF intake access road. The IEM observed a large trench excavated between the buried conduit access road and the transmission line. None of the representatives from CE or INX were aware that the trench had been excavated nor when the works occurred. All parties agreed to suspend works until more information regarding this new drainage feature was available.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
	<i>Email</i>	SES, CE, WEL, INX	<p>The IEM requested that CE provide an update on the design of the conduit over drains considering the newly excavated drainage ditch between the access road and the transmission line. The IEM also stressed that no notification was given for these works, despite crews working in and close to water. Additionally, the IEM noted that the work area was buried by approximately 30 cm of snow, and requested confirmation that CE would clear all snow prior to decompaction and reclamation activities.</p> <p>WEL informed the IEM that their crews were not responsible for excavating the ditch.</p>	-
December 1	<i>Email</i>	SES, CE, INX	<p>The IEM observed crews mixing snow, organics, and mineral soil while creating access to the damaged Truckwash Creek over drain. These materials pose a significant sediment and erosion control risk in the spring. The IEM cautioned against using mixed materials to build an access road, and informed CE that all mixed material should be removed from the road surface immediately following the completion of the Truckwash Creek over drain repairs.</p>	ITM ULR#64
December 3	<i>Email</i>	CE, SES, INX	<p>CE provided the IEM and INX with the meeting minutes for the environmental coordination conference call that occurred on December 1, 2016.</p>	-

3.0 Current Work Restrictions and Timing Windows

The table presented below outlines work restrictions applicable during the reporting period for each active Project component location:

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
Lillooet River FSR, ULRHEF, & BDRHEF intake	Access roads above the lower limit of the 200m buffer to the Truckwash Creek Migration Corridor to the ULRHEF intake, as well as a portion of BDRHEF intake access road and intake structure within UWR u-2-002 UL 12	Mountain Goat UWRs & Migration Corridor	<p>The IEM was onsite to oversee daily construction equipment shutdowns (November 1 - 30) beginning one hour before and two hours after sunrise as well as two hours before and one hour after sunset.</p> <p>Mountain Goat monitoring activities will occur daily throughout the winter and spring (November 1 – June 15) when construction activities are occurring at the ULRHEF lower tunnel portal and/or the ULRHEF intake.</p> <p>All intake works and construction, in or within 500 m of UWR u-2-002 UL 12, will not occur from November 15 to April 30.</p> <p>NOTE: BDRHEF intake electrical works and installation of the intake gate heating system was evaluated by a QP and determined to be similar to operations type maintenance works and of low potential risk to mountain goats. These works were complete as of November 22 (7 days beyond November 15) under the supervision of the IEM.</p> <p>If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.</p>
TX Line	Segment 16	Mountain Goat UWRs SO-04 & SO-08	If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.
		Moose, Deer, & Mountain Goat UWRs	<p>Construction will not be permitted within 200m of Moose and Deer UWR during the sensitive winter period (November 1 – February 28).</p> <p>Helicopter flight paths will avoid UWRs and landing locations will be located further than 500m away from the UWRs during the sensitive winter period (November 1 – February 28).</p>

4.0 Upper Lillooet River HEF – Monitoring Results

4.1 Construction Camp, KM38 Laydown, Access Roads & Lillooet River FSR

Construction Activities:

- CE continued routine fuel management and maintenance of construction equipment within the mechanic shop at the KM38 laydown. CE temporarily stored all hazardous substance materials (waste oil, contaminated soil, used oil/hydraulic fluid containers, etc.) in a designated area at the laydown prior to off-site disposal. The materials were all well contained and protected from the weather.
- Road maintenance and snow removal on the Lillooet River FSR and site access roads.
- PAG storage reclamation at KM41.7 on the Lillooet River FSR (Photo 1).
- CE increased the elevation of the Lillooet River FSR from KM41.5 – 42.25 to reduce the risk of flooding from the road side ditch (Photo 2).
- Installation of new culverts under the PAG storage access road to improve drainage (Photo 3).
- CE re-opened access to the conduit pull box closest to the upstream bridge crossing near KM48 of the Lillooet River FSR (Photo 4).
- CE's QP conducted a danger tree assessment on the Lillooet River FSR and all work site access roads.

Environmental Summary:

- The IEM inspected snow plowing operations, and noted that no ungulate escape routes had been plowed through the snow banks of the FSR. However, the snow banks did not exceed 50 cm and were unlikely to prevent wildlife from exiting the roadway. The IEM did request that CE begin clearing the escape routes as more snow is forecast.
- CE continued reclamation of the PAG storage pile at KM41.7 (Photo 1), as per their QP's recommendations. The IEM periodically inspected these works and no environmental issues were observed.
- On November 21 and 22, CE added approximately 2 metres of material to the Lillooet River FSR between KM41.5 and 42.25 to reduce the likelihood of flooding from the road side ditch (Photo 2). The IEM monitored these construction activities and did not observe any environmental issues.
- On November 24, the IEM noticed that CE had installed two new culverts under the access road to the KM41.7 access road to the PAG storage pile (Photo 3). The IEM was not notified of this activity, even though they were installed in a ditch with flowing water that discharges to the Lillooet River. The IEM requested that CE prepare an environmental incident report and provide the specific best management practices used to protect water quality while installing the culverts (EIR#33).

- On November 30, CE partially re-opened a portion of the old Lillooet River FSR (the upstream crossing of the unnamed creek near KM48), to gain access to a conduit pull box (Photo 4). The IEM was not notified of this activity, despite its occurrence within 15 metres of a fish bearing water course, and was therefore unable to monitor the construction activities. After inspecting the works the IEM requested that drainage be installed to convey water to the exiting drainage network on the FSR and reminded CE that they must notify the IEM prior to conducting works near flowing water.

Photos:



Photo 1 – Capping the PAG storage pile at KM41.7 (November, 27, 2016).



Photo 2 – Raising the elevation of the Lillooet River FSR between KM41.5 and 42.25 (November 22, 2016).



Photo 3 – Newly installed culverts at the PAG storage access road (November 24, 2016).



Photo 4 – Partial re-opening of the Lillooet River FSR to access the pull box near KM48 (November 30, 2016).

4.2 Intake, Concrete Arch Foundation Walls, and Upstream Tunnel

Construction Activities:

- Obermeyer repair and dry commissioning of the ULRHEF intake gates (Photo 5 - Photo 6 & Photo 9).
- Deactivation of the temporary ULRHEF intake access road (Photo 7).

- Demobilization of trailers, water pipes, and equipment.
- Installation of perimeter fence around the ULRHEF intake (Photo 8).
- Electrical works at the ULRHEF intake.

Environmental Summary:

- The IEM monitored construction activities at the ULRHEF intake throughout the monitoring period and did not observe any environmental issues.

Photos:



Photo 5 – Repair works on the Obermeyer weir (November 21, 2016).



Photo 6 – Dry commissioning of the Obermeyer (November 30, 2016).



Photo 7 – Deactivation of the temporary access road to the ULRHEF intake (November 21, 2016).



Photo 8 – Installation of chain linked fence around the ULRHEF intake (November 30, 2016).



**Photo 9 – Commissioning the ULRHEF intake gates
(November 21, 2016).**

4.3 Downstream Tunnel Portal

Construction Activities:

- Demobilization of trailers and equipment.
- Penstock and tunnel backfill (Photo 10).

Environmental Summary:

- On November 21, heavy rains caused a significant amount of runoff on the downstream tunnel access road. The runoff was directed into the road side ditch and into an infiltration pond at the bottom of the access road, where a 2” pump was installed to pump excess water to vegetation. However, the pump was not turned on, thus the pond overflowed into Truckwash Creek (Photo 11). The IEM informed CE of the issue and crews immediately started the pump and diverted the road runoff to vegetation. Due to poor access and icy conditions the IEM was unable to obtain water quality samples downstream of the discharge point. However, water within Truckwash Creek was visually clear and it did not appear that the road runoff had a negative impact on WQ.
- All tunnel seepage water through the ULRHEF tunnel continues to discharge through the flushing pipe into Truckwash Creek. The IEM visually monitored water quality and did not observe any impacts to downstream water quality.

Photos:



Photo 10 – Backfill of the penstock - lower tunnel portal connection (December 1, 2016)



Photo 11 – Sediment laden water flowing into Truckwash Creek had no visual WQ impact (November 21, 2016)

4.4 Penstock and Truckwash Creek Penstock Crossing

Construction Activities:

- Sandblasting, welding, and coating the inside of the penstock.
- Repairing a bulged section of the penstock.
- Flushing the ULRHEF penstock (Photo 12).
- Repair of the Truckwash Creek over drain (Photo 13 - Photo 16).

Environmental Summary:

- On November 25, CE conducted the first flush to clean the ULRHEF penstock (Photo 12). Approximately 10,000L of water was used to flush the penstock floor, removing residual coating, welding debris, and sediment that remained following the physical cleaning of the penstock. All penstock flush water was captured at the bottom of the penstock and stored in 1000L containers. Water samples were collected during the initial flush and at the end of the flush to confirm that water quality met BCWQGs for the protection of aquatic life. Water samples were analyzed for hydrocarbon and metal content. The penstock flushing water will be stored onsite until lab results are returned confirming that the water is safe to release to ground.
- On December 1, CE reopened the penstock access road to begin repairs on Truckwash Creek penstock over drain. To protect the buried penstock from heavy equipment, CE added material to the existing road (Photo 13). However, the material crews used to raise the elevation of the road, was a mixture of snow, organics, and mineral soil. The IEM cautioned against using mixed materials to build an access road, and informed CE that all mixed material should be removed from the road surface immediately following the completion of the Truckwash Creek over drain repairs (ITM ULR#64).

- On December 2, CE excavated a small sump and installed two 6" pumps to divert Truckwash Creek around the damaged penstock over drain work area (Photo 14). The discharge of the pumps were directed to a riprap slope downstream of the penstock crossing (Photo 15). The IEM observed instream activities and monitored turbidity approximately 200 metres downstream of the work area. Once instream works commenced the IEM observed three small spikes in turbidity (<25 NTU above background), none of which lasted more than 10 minutes before returning to within BCWQG. Additional water quality results are available upon request. On December 3, the penstock over drain was isolated from flowing water and crews began re-building the over drain to design specifications (Photo 16).

Photos:



Photo 12 – Two-inch pump at the bottom of the penstock to capture flushing water to pump it into 1000L containers (November 25, 2016).



Photo 13 – Improper materials management while re-opening the Truckwash 2 access road (December 1, 2016).



Photo 14 – Installation of a 6" pump to divert Truckwash Creek around the penstock over drain (December 2, 2016).



Photo 15 – Discharge of the 6" hose on to riprap downstream of the penstock over drain (December 2, 2016).



Photo 16 – Rebuilding the penstock over drain to design specifications post-flood event (December 3, 2016).

4.5 Powerhouse, Tailrace & Access Road

Construction Activities:

- Mechanical and electrical works (Photo 17), and Stage 2 concrete works.
- Repair of ULRHEF powerhouse superstructure deficiencies (Photo 18).
- Switchyard works (Photo 19).
- Cleaning draft tubes 3 and 4.

Environmental Summary:

- The IEM monitored construction activities throughout the monitoring period and observed no environmental issues.

Photos:



Photo 17 – Mechanical and electrical works in the ULRHEF powerhouse (November 25, 2016)



Photo 18 – CE addressing deficiencies on the ULRHEF powerhouse superstructure (November 25, 2016)



Photo 19 – ULRHEF switchyard (November 28, 2016)

4.6 Water Quality Results

The following table presents the results of the routine WQ sampling program for the ULRHEF. The IEM is undertaking a weekly monitoring program per the conditions outlined in the Surface Water Quality Protection Plan. The IEM selected the regular monitoring to quantify WQ conditions within the Lillooet River upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in the Lillooet River due to seasonal fluctuations in snowmelt. In the event of an exceedance of in-situ WQ (turbidity and/or pH) because of project-related activities, the IEM will highlight the exceedance, discuss the cause, and outline measures undertaken by the contractor to correct the issue. When an exceedance cannot be attributed to project-related activities, an asterisk (*) will be used to denote it.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
Routine Water Quality						
November 24, 2016	13:51	ULR Background – ULRHEF Intake	8.0	37.8	98	0.6
	13:44	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	8.0	21.9	102	0.6
	15:09	ULR # 1 – Upstream of ULRHEF Powerhouse	8.1	26.2	100	0.6
	14:50	ULR #2 – Downstream of ULRHEF Powerhouse between KM40.5 and KM41	8.1	25.5	98	0.6
	13:59	ULR #3 – Lillooet River FSR KM38 Laydown – D/S of Boulder confluence	7.9	17.5	93	0.6
	17:00	ULR #4 – Lillooet River FSR KM24 – D/S of all works and Meager confluence	7.9	12.3	96	0.6
December 3, 2016	10:55	ULR Background – ULRHEF Intake	7.4	12.2	119	3.1
	11:15	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.5	13.5	121	3.2
	12:35	ULR # 1 – Upstream of ULRHEF Powerhouse	7.7	12.3	115	3.4

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
	12:55	ULR #2 – Downstream of ULRHEF Powerhouse between KM40.5 and KM41	7.7	12.3	114	3.3
	14:45	ULR #3 – Lillooet River FSR KM38 Laydown – D/S of Boulder confluence	7.7	8.2	111	3.3
	16:30	ULR #4 – Lillooet River FSR KM24 – D/S of all works and Meager confluence	7.8	9.9	134	3.7

4.7 Recommendations

IEM recommendations for the ULRHEF are as follows:

- CE should ensure that escape routes are plowed through snow berms along road edge at approximately 100 metre intervals to allow ungulates safe passage off of the FSR and worksite access roads.
- During rain fall events CE should ensure that the 2” pump at the bottom of the ULRHEF downstream tunnel access road is operational to prevent sediment laden water from entering Truckwash Creek.
- CE should remove all mixed material from the Truckwash 2 access road immediately after completing repairs on the penstock over drain ITM ULR#64.

4.8 Upcoming Works

New and/or environmentally sensitive construction activities scheduled to occur at the ULRHEF:

- Reclamation of the spoil pile at KM42.5.
- Removal of the PAG storage access road culvert.
- Electrical works at the ULRHEF intake.
- Repairs on the bulged section of the ULRHEF penstock.
- Truckwash Creek penstock over drain repairs.
- Mechanical and electrical works in the ULRHEF powerhouse.
- Installation of the switchyard.

5.0 Boulder Creek Hydroelectric Facility – Monitoring Results

5.1 Access Road & Intake

Construction Activities:

- Mechanical and electrical works at the BDRHEF intake structure (Photo 20 - Photo 21).
- Repair of the Stream 9 bridge and powder magazine access road (Photo 22 - Photo 24).

Environmental Summary:

- According to the Mountain Goat Management Plan, all intake works and construction, in or within 500 m of UWR u-2-002 UL 12, will not occur from November 15 to April 30; however minor electrical works and installation of the intake gate heating system were not able to be completed prior to November 15. After numerous discussions between INX, the IEM and IE, and two QP prepared memorandums outlining the scope and schedule of works, as well as an evaluation of risks to Mountain Goats within UWR UL-12; the IEM determined that minor works could proceed at the BDRHEF intake post November 15. This decision was largely based on a QP evaluation of the works which outlined that the works presented low potential risk to mountain goats; therefore, the intent of the condition restricting construction activities at the BDRHEF intake could be achieved with a prescribed list of mitigation measures in place. The following mitigation measures were implemented during electrical works and installation of the intake gate heating system at the BDRHEF intake from November 20 – 22:
 - Only hand power tools and a small generator were used.
 - An 8-person crew worked at the intake, travelling to site in pick-up trucks. No snow plowing of the access road occurred or was required. Parts were brought to site with a rubber tracked loader on one occasion and noise levels remained within ambient levels 50m from the equipment.
 - Noise level monitoring was performed by the IEM within 50 m from the work site; noise levels did not exceed ambient levels at 50m from the electrical works (Photo 20).
 - The IEM monitored for mountain goat presence within 500 m line of site from the works site, and no mountain goats were observed.
- All electrical works and installation of the intake gate heating system were complete at the BDRHEF intake as of November 22 (7 days beyond November 15) under the supervision of the IEM. Dry commissioning works will proceed until avalanche conditions prevent access, as no active avalanche control will occur. Wet commissioning works will proceed in 2017 under Leave to Commence Diversion (LTCD) authorization.
- On November 22, CE performed instream works to divert Stream 9 back to its original alignment and repair the access road to the explosive magazine. Prior to instream excavation, a QP (Ecofish) installed nets to isolate the work area and conducted a fish salvage (Photo 22), no fish were captured. The excavator operator created a temporary crossing with downed timber and temporary track stringers, which permitted the excavator to cross the wetted portion of the new channel in the dry, protecting both the substrate and WQ. The operator then began excavating the debris jam on the upstream end of the woodbox culvert in dry conditions. Once the debris was removed, CE conducted instream excavation within the isolated section to direct the stream flow back into the original channel (Photo 23). The IEM monitored water quality during instream work and recorded a spike in turbidity (max turbidity = 1154AU) immediately after the stream was relocated into the original channel (Photo 24). The spike in turbidity decreased gradually and returned to within BCWQG within two hours. Additional water quality results are available upon request.

Photos:



Photo 20 – Monitoring noise levels at the BDRHEF intake (November 20, 2016).



Photo 21 – Crews installing electrical components at BDRHEF intake (November 20, 2016).



Photo 22 – Fish salvage and debris removal at Stream 9 (November 22, 2016).



Photo 23 – Diverting stream 9 back into the original channel (November 22, 2016).



Photo 24 – Conditions downstream after diverting Stream 9 into its original channel (November 22, 2016).

5.2 Downstream Tunnel Portal and Powerhouse

Construction Activities:

- Tunnel plug grouting program.
- Tunnel liner installation.
- Electrical works in the powerhouse (Photo 25).
- Switchyard installation.
- Bifurcation concrete works (Photo 26).

Environmental Summary:

- CE conveyed all wastewater related to the BDRHEF tunnelling works to the downstream settling ponds for treatment throughout the monitoring period (Photo 27).
- On November 30, the IEM, CE and INX held a pre-work meeting to discuss the installation of drainage features (over drains) over the buried conduit from the BDRHEF powerhouse to the BDRHEF intake access road. On site, all parties observed a large drainage ditch excavated between the conduit access road and the transmission line (Photo 28). This drainage feature was unknown to all parties attending the meeting and is not on the approved design drawing. CE decided to suspend work in the area until more information could be obtained and the design for the area is adjusted to the new conditions. No immediate ESC risks are present as the area is under snow; however the final design should be developed and installed prior to spring melt.

Photos:



Photo 25 – Electrical works in the BDRHEF powerhouse (November 24, 2016).



Photo 26 – Concrete pour on the BDRHEF bifurcation (November 28, 2016).



Photo 27 – BDRHEF lower tunnel portal sediment ponds (November 28, 2016).



Photo 28 – Drainage channel excavated between the conduit access road and transmission line (November 30, 2016).

5.3 Water Quality Results

The following table presents the results of the routine WQ sampling program for the BDRHEF. The IEM is undertaking a weekly monitoring program per the conditions outlined in the Surface Water Quality Protection Plan. The IEM selected the regular monitoring to quantify WQ conditions within Boulder Creek upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in Boulder Creek due to seasonal fluctuations in snowmelt. In the event of an exceedance of in-situ WQ (turbidity and/or pH) because of project-related activities, the IEM will highlight the exceedance, discuss the cause, and outline measures undertaken by the contractor to correct the issue. When an exceedance cannot be attributed to project-related activities, an asterisk (*) will be used to denote it.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
Routine Water Quality						
November 24, 2016	-	BDR BG – Upstream of BDRHEF intake	Inaccessible; Construction works complete			
	-	BDR #1 – Downstream of BDRHEF intake	Inaccessible; Construction works complete			
	14:31	BDR #2 – Upstream of BDRHEF Powerhouse	7.6	1.6	74	0.7
	14:19	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.9	2.5	73	0.6
December 3, 2016	-	BDR BG – Upstream of BDRHEF intake	Inaccessible; Construction works complete			
	-	BDR #1 – Downstream of BDRHEF intake	Inaccessible; Construction works complete			
	13:05	BDR #2 – Upstream of BDRHEF Powerhouse	7.6	2.0	82	4.0
	13:20	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.6	2.1	80	4.0

5.4 Recommendations

IEM recommendations for the BDRHEF are as follows:

- CE should continue to direct all construction related wastewater to the lower tunnel portal settling ponds. CE should continue to monitor the newly constructed settling/infiltration pond to ensure that it remains in good working condition, and preform all maintenance activities as outlined in the work plan. If water begins to discharge from the newly constructed channel, CE should conduct regular inspections to ensure that it meets BCWQGs prior to infiltration or connection with the Boulder Creek side channel.

5.5 Upcoming Works

New and/or environmentally sensitive construction activities scheduled to occur at the BDRHEF:

- Tunnel liner installation and tunnel plug rebar, formwork, and concrete works.
- Rock trap foundation and flushing pipe installation.

6.0 Transmission Line – Monitoring Results

6.1 Transmission Line Construction Activities

Construction Activities:

Segment 1

- Transmission line connection with ULRHEF switchyard (Photo 29).

Segment 2

- Danger tree falling near structure 29.
- Working on the BDRHEF powerhouse tap and switch at structure 17 (Photo 30).
- Transmission line connection with BDRHEF switchyard.

Segment 14

- Clearing hazard trees.

Environmental Summary:

- The IEM monitored construction activities throughout the monitoring period and observed no environmental issues.

Photos:



Photo 29 – Crew preparing to connect the transmission line with the ULRHEF switchyard (November 21, 2016).



Photo 30 – Crews working on the switch at structure 17 in Segment 2 (November 22, 2016).

6.2 Recommendations

IEM recommendations for the Transmission Line are as follows:

- WEL’s Environmental Manager continues to provide regular scheduling updates that permits the IEM to assess environmental risks and coordinate monitoring requirements. WEL should continue to provide the IEM with a minimum of 48 hours’ notice if IEM presence is required or expected for construction activities.

6.3 Upcoming Works

New and/or environmentally sensitive construction activities scheduled to occur along the Transmission Line alignment:

Segment 12

- Splicing fiber optics cables throughout the segment.

Segment 16

- Pulling and splicing fiber optic cables throughout the segment.

7.0 Wildlife Sightings

As per the CEMP, the IEM implemented a wildlife sightings record. Project Personnel are required to regularly update the record and it is mandatory for all personnel to report wildlife sightings including, but not limited to bears, cougars, mountain goats and deer. Wildlife Observation forms will be included in first reporting period following month end. Observation or detection of the following species will trigger notification to identified parties according to the following table.

Species Observed or Detected	Notification Period	Agencies to be Notified
Northern rubber boa	Immediately	IEM, Owner
Grizzly bear	24hrs	IEM, Safety Officer, Conservation Officer, Owner
Wolverine den	24hrs	IEM, MFLNRO, Owner
Spotted owls	24hrs	IEM, MOE, Owner
Mountain goats	48hrs	IEM, MFLNRO, Owner

The Owner, Contractors, and IEM team reported the following wildlife sightings in November 2016:

Upper Lillooet Hydro Project - Wildlife Observation Form					
Date	Time	Observer (Company)	Species or Description	Location	Comments
11/1/2016	15:30	Andre	Cinnamon Black Bear	KM46.5	Thought was a Grizzly but was a healthy big black bear
11/11/2016	17:40	Ruby Dan	Cougar	KM37.5 Gate	Cougar was visible in trees near the gate.
11/27/2016	nightshift	?	2 moose	KM46	Cow and a calf on the road
11/27/2016	10h00	Anne Sutherland	moose tracks	KM46	GPS 0467336 5613774
11/29/2016	11h30	Roger Pelletier	Moose	KM46	

8.0 Mountain Goat Monitoring Program

The mountain goat monitoring program resumed November 1, 2016. The following mitigation measures related to mountain goats were implemented during this monitoring period:

- The BDRHEF intake access road is gated and manned by CE staff to restrict motorized public access to the UWR (UL-12). The gate will continue to be manned by CE until completion of works at the intake.
- The IEM completed noise monitoring and monitored for mountain goats within 500m line of sight of electrical and minor mechanical equipment installation at the BDRHEF intake from November 20 – 22. Noise generated by hand tools and by vehicle travel supporting the works did not generate noise above ambient conditions, and no mountain goats were observed within 500m of construction activities. Minor electrical and mechanical equipment installation is now fully complete (as of November 22) and the IEM received notification that the BDRHEF is now in the commissioning phase as all construction activities are complete.

- IEM was onsite to audit daily construction equipment shutdowns (November 1 - 30) beginning one hour before and two hours after sunrise as well as two hours before and one hour after sunset. No project related traffic violated the daily equipment shutdown and mountain goat migration corridor travel restrictions from November 20 – 30.
- The IEM will continue to be onsite daily to monitor construction activities during the mountain goat migration period and sensitive winter months. If the IEM determines that noise monitoring is necessary we will return to performing active noise level monitoring.
- The IEM or designate was on site to monitor Mountain Goat activity within 500m of construction activities at the ULRHEF intake and the ULRHEF downstream tunnel portal. Mountain goats were monitored from four sites:
 - Truckwash Creek viewing river right of the Migration Corridor– MG-OBS01 (10U 467955 5612773);
 - Keyhole Falls viewing the south side u-2-002 UL11 – MG-OBS02 (10U 466593 5613988); and,
 - Garibaldi Pumice mine site viewing u-2-002 UL 19 – MG-OBS03 (10U 467388 561408); and,
 - Salal Creek monitoring site viewing u-2-002 UL 8 – MG-OBS04 (10U 466133 5613991).
- Monitoring effort was split between all sites during daylight hours, unless safety concerns or weather conditions interfered. The order of site visits rotated daily. Construction activities must cease if a goat(s) are observed moving towards the ULRHEF intake and/or if a goat(s) are observed within a 500m line of site of a construction activity. No goats were observed within 500m line of sight of construction activities and no work stoppages were required.
- To mitigate potential impacts to mountain goats during the sensitive winter period, construction activities will cease if a mountain goat(s) is (are) observed moving towards the ULRHEF intake and/or if a mountain goat(s) is (are) observed within a 500m line of site of a construction activity. No mountain goats were observed within 500m line of sight of construction activities and no work stoppages were required during this monitoring period.

9.0 Environmental Issues Tracking Matrix (ITM)

9.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

ITM Tracking Legend:		<i>Work Item Open</i>						
		<i>Work Item Complete</i>						
		<i>Issue Closed</i>						
Issue Tracking		Environmental Issue		Mitigation Measures				
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed	
ULR#58	OPEN	All work areas	Conservation Officer and BCEAO Compliance and Enforcement Officer Inspection noted non-compliance with regard to wildlife attractant management.	1. Develop, implement and document internal waste and attractant management auditing tool. Tool will be available for use by the IEM and CE's EM Team. Records of inspections and noted non-compliances should be tracked internally with clean-up documented in each report. This tracking tool will be available to agencies upon request. This tool should be used similarly to the Spill Reporting tool currently being employed onsite.	July 6, 2016	July 9, 2016	July 8, 2016	
				2. Repair and adjust the electric fences and charged entrance mats at the construction camp (perimeter fence, camp kitchen fence, and waste compactor fence) and surrounding the septic field.			July 21, 2016	
				3. Install self-closing door hinges in all site lunchrooms and anywhere food is being stored temporarily (lunch rooms, kitchen storage area) OR adjust how food is transported, stored and consumed onsite to eliminate the possibility of food and food waste attractants onsite.			July 21, 2016	
				4. Perform maintenance to clean-up grease and liquid waste around and underneath the garbage compactor			July 21, 2016	
				5. Install berms surrounding parking areas that are lined with impermeable fabric in areas where tunneling equipment is parked. All leaks could be considered wildlife attractants; therefore all leaky equipment should be repaired and leaks or spills to ground in parking areas must be cleaned up daily and be disposed of in appropriate contaminated soil bins. Update October 27: CE continues to demobilize tunneling equipment, which remains parked within the lined parking areas. Leaks on the pad continue to be observed and should be removed on a regular basis as required to prevent attracting wildlife. This item remains open as hydrocarbon staining in the parking areas continue to be observed.				

ITM Tracking Legend:		Work Item Open		Work Item Complete		Issue Closed	
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
ULR#60	OPEN	Lillooet River FSR from 46 – 48 Km	The road fill slope of the Lillooet River FSR between KM46 – KM48 requires ESC measures to ensure slope stability and prevent rill erosion from transporting material into the forested area below.	1. Assess the road fill slope conditions following conduit installation in the Lillooet River FSR in this section. Update September 30, 2016: CE and the IEM have assessed areas of concern and have discussed ESC stabilization/reclamation of the slopes by hydro-seeding with alder and hydro-mulch of appropriate strength (BFM) and at sufficient application rate.	August 8, 2016	August 16, 2016	September 30, 2016
				2. Provide and implement an agreed upon plan to protect the slope from an erosion and sediment transport perspective and/or a plan to initiate reclamation of the impacted area. Update October 27, 2016: A plan has been agreed upon, however the implementation remains outstanding. This issue has now been open for more than 2 months, and the window to successfully hydro-seed now closed.			
ULR #63	OPEN	Conduit alignment between the BDRHEF intake access road and BDRHEF powerhouse along TX Line ROW.	Drainage paths interrupted by conduit installation have resulted in significant erosion and does not conform to the work plan or design.	3. The work plan and design of the power and tech cable conduit between the BDRHEF intake access road and the BDRHEF powerhouse called for the installation of swales at all ephemeral drainage paths. The work plan and design were not implemented resulting in substantial erosion along the conduit alignment and along two of the TX Line temporary access roads. An updated drainage plan should be prepared and installed to prevent further erosion. Update November 30: A drainage ditch was installed that bisects six identified ephemeral drainage paths along the conduit alignment without notification to the IEM. The IEM has requested an update on when the work was performed and to what end, as this ditch does not currently meet the design.	November 10, 2016	November 17, 2016	
ULR #64	OPEN	Penstock access road and riparian area on the left bank of Truckwash Creek	Organics, mineral soils, and snow were mixed during construction of an access path on the left bank of Truckwash Creek	1. Soils (organics and mineral soil) were mixed with snow and placed on an access path constructed to perform Truckwash Creek over-drain repairs. This material is placed on the permanent penstock access road and in the riparian area of Truckwash creek, which will need to be reclaimed in 2017. The mixed material (organics, soils, and snow) are to be removed upon completion of the penstock over-drain repair works, to eliminate the ESC risk.	December 1, 2016	Upon completion of Truckwash Creek over-drain repairs	

(next ITM – BDR#28 & ULR#65)

9.2 Transmission Line

ITM Tracking Legend:		<i>Work Item Open</i>						
		<i>Work Item Complete</i>						
		<i>Issue Closed</i>						
Issue Tracking		Environmental Issue			Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed	
<i>No outstanding environmental issues (next ITM – Tx#3)</i>								











Environmental Incident Reporting Form

General Information	
Project Name: Upper Lillooet Hydro Project	Project Component: Lillooet River FSR Ditch line at KM 41.8
Time/Date of Incident Start: 2016-11-22 at ~ 9:00PM	Time/Date Incident Stopped: 2016-11-22 at 9:30 PM
Date of Report: 2016-11-26	Project Incident Report Number: 2016-11-22 CE-EIR-033
Report Prepared By: Jean M. Pelletier	
Contractor's Environmental Manager: Jean M. Pelletier — Ian McKeachie	
Independent Environmental Monitor: Tom Hicks - Mike Champion –Stephanie Ellis	
Licensee's Environmental Coordinator: Julia Mancinelli	

Contact Information for Company Involved in Incident	
Company: CRT-ebc, s. e. n. c.	Address: PO Box 585, Pemberton BC – V0N 2L0
Phone #: 604-894-5002	Email: jdrapeau@crtconstruction.ca
Contact Person: Jonathan Drapeau	Position: Project Manager

Incident Type (check all that apply)			
Encroachment of an Environmentally Sensitive Area (e.g. Riparian/Wildlife Buffer) Please provide details in "Description" section below.	<input checked="" type="checkbox"/>	Adverse Impacts to Fish/Wildlife (e.g. Mortality/Injury) Please provide details in "Description" section below.	<input type="checkbox"/>
Water Quality/Quantity Please provide details in "Description" section below.	<input checked="" type="checkbox"/>	Hazardous Material Spills (to ground or water) Please provide details in description section in regards to: <ul style="list-style-type: none"> Perceives extent of damage Type, quantity and area of the spill Containment Procedures Environmental features in close proximity to the spill 	<input type="checkbox"/>
Disturbance of known or unknown archeological /heritage site Please provide details in "Description" section below.	<input type="checkbox"/>	Air Quality Please provide details in "Description" section below.	<input type="checkbox"/>
Spill reported to external agencies If yes, describe the receiving environment and substance/quantity spilled.	<input type="checkbox"/>	Other Please provide details in "Description" section below.	<input type="checkbox"/>

Incident Profile								
Weather at time of incident	 <input type="checkbox"/> Clear	 <input type="checkbox"/> Partly Cloudy/ Variable	 <input type="checkbox"/> Cloudy	 <input type="checkbox"/> Showers/ Periods of Rain	 <input type="checkbox"/> Rain	 <input type="checkbox"/> Heavy Rain (>25mm in 24hr)	 <input type="checkbox"/> Storm (Heavy rain and high winds)	 <input checked="" type="checkbox"/> Snow
Specific Location: Upper Lillooet Intake Upstream Cofferdam								
Description and Cause of Incident:								
<p><u>Description:</u> On Tuesday evening, November 22nd, a foreman working near a spoil area at KM 41.8 was directed by a superintendent to install a culvert in a roadside ditch. To do so, the foreman diverted the water to a ditch around the stockpile for about 30 minutes. He then proceeded to install the culvert in the dry. As soon as it was completed, he removed the plug and the water was redirected in its normal pathway in the ditch. This ditch currently discharges into the Lillooet River near KM 41.2.</p> <p>Construction crews failed to notify CRT's environmental or engineering teams of this activity during either of the daily meetings (05:45 or 15:30). Therefore, the IEM nor a member of CRT's environmental team were present to monitor the diversion of the water course, installation of the culvert, re-alignment of the water course, or to monitor water quality during construction activities.</p> <p><u>Cause:</u> No notification of construction activities in flowing water.</p>								
Incident Witness: Stephanie Ellis (IEM)								
Were there any Potential Environmental impacts as a result of the incident? (e.g., surface contamination, storm sewers, or fish/wildlife mortalities)							Yes <input type="checkbox"/>	None Observed <input checked="" type="checkbox"/>
If Yes, please describe: No environmental personal were present to monitor the construction activities or water quality.								
Has Wildlife Salvage Protocol been followed? i.e. Carrion Removal						Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
If No, please explain:								
Water Quality Samples Collected?						Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
<p>If yes, attach results of water quality analysis to report in table format. Include Laboratory analysis if completed.</p> <p>If No please explain: No environmental personal were present to monitor the construction activities or water quality.</p>								
Have applicable photos and/or drawings been attached to the incident report?						Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
Incident Response Measures								
See incident description above								



Actions to Prevent Incident Recurrence


The Environment manager reminded superintendents and foremen that no construction activities in or near water are to occur without the IEM presence. Additionally, the Environmental manager reminded superintendents and foremen of their obligation to inform the Environment Team of any sensitive work involving water so a notification can be sent to the IEM 24hrs prior to work starting.

Notification Record


Agency Reported to	Contact Information	Agency Contacted		Date Reported	Reported By	Method of Reporting
		Yes	No			
External						
MFLNRO	James Davies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email within 48 hours of the EIR being finalized.
BCEAO	Monica Perry Sheldon Foote Justin Carlson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email within 48 hours of the EIR being finalized.
Lil'wat Nation	Harriet VanWart Carrie Lester	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email within 48 hours of the EIR being finalized.
RAPP	Conservation Officer	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
PEP	1-800-663-3456	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
DFO	Herb Klassen	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Environment Canada	604-666-6100	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Canadian Coast Guard	604-666-6011	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Local Fire Rescue	911	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Internal						
Innergex	Julia Mancinelli	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 24, 2016		Email
IEM	Mike Champion – Stephanie Ellis – Tom Hicks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 24, 2016		IEM phoned; Emailed INE
IE	Jenn McCash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email



Independent Environmental Monitor:

Tom Hicks	Lead Field IEM – Sartori Environmental Services		2016 Nov 26th
Print Name	Position and Company	Signature	Date

Contractor's Manager:

Jean M. Pelletier	Environmental Manager		2016 Nov 26th
Print Name	Position and Company	Signature	Date











Environmental Incident Reporting Form

General Information	
Project Name: Upper Lillooet Hydro Project	Project Component: Mountain Goat Migration Corridor on the Lillooet River FSR
Time/Date of Incident Start: 2016-11-25 around 6:50 AM	Time/Date Incident Stopped: 2016-11-25 around 2:22 PM
Date of Report: 2016-11-26	Project Incident Report Number: 2016-11-25 CE-EIR-034
Report Prepared By: Ian McKeachie	
Contractors Environmental Manager: Jean Pelletier – Ian McKeachie	
Independent Environmental Monitor: Tom Hicks - Mike Champion –Stephanie Ellis	
Licensee’s Environmental Coordinator: Julia Mancinelli	

Contact Information for Company Involved in Incident	
Company: CRT-ebc, s. e. n. c.	Address: PO Box 585, Pemberton BC – V0N 2L0
Phone #: 604-*894-5002	Email: jdrapeau@crtconstruction.ca
Contact Person: Jonathan Drapeau	Position: Assistant Project Manager

Incident Type (check all that apply)			
Encroachment of an Environmentally Sensitive Area (e.g. Riparian/Wildlife Buffer) Please provide details in “Description” section below.	<input checked="" type="checkbox"/>	Adverse Impacts to Fish/Wildlife (e.g. Mortality/Injury) Please provide details in “Description” section below.	<input type="checkbox"/>
Water Quality/Quantity Please provide details in “Description” section below.	<input type="checkbox"/>	Hazardous Material Spills (to ground or water) Please provide details in description section in regards to: <ul style="list-style-type: none"> Perceives extent of damage Type, quantity and area of the spill Containment Procedures Environmental features in close proximity to the spill 	<input type="checkbox"/>
Disturbance of known or unknown archeological /heritage site Please provide details in “Description” section below.	<input type="checkbox"/>	Air Quality Please provide details in “Description” section below.	<input type="checkbox"/>
Spill reported to external agencies If yes, describe the receiving environment and substance/quantity spilled.	<input type="checkbox"/>	Other Please provide details in “Description” section below.	<input checked="" type="checkbox"/>

Incident Profile									
Weather at time of incident	 <input type="checkbox"/> Clear	 <input type="checkbox"/> Partly Cloudy/ Variable	 <input type="checkbox"/> Cloudy	 <input type="checkbox"/> Showers/ Periods of Rain	 <input type="checkbox"/> Rain	 <input type="checkbox"/> Heavy Rain (>25mm in 24hr)	 <input type="checkbox"/> Storm (Heavy rain and high winds)	 <input checked="" type="checkbox"/> Snow	
Specific Location: FSR @ KM 43.8 - 48									
Description and Cause of Incident:									
<p><u>Description:</u> On November 25, 2016, the daily operational shutdowns for mountain goat migration were in effect on the Lillooet River FSR from 06:41-09:41 (sunrise) and 14:16-17:16 (sunset). At approximately 06:50, one SUV traveled through the mountain goat migration corridor from the downstream portal and passed the gatekeeper at KM 43.8. At approximately 14:22, two pick-ups, one a CE electrician and one Carbonneau, traveled through the corridor during sunset shutdown and passed the gatekeeper at KM 43.8 KM.</p> <p><u>Cause:</u> The road block at KM 48 was not in place during either the sunrise or sunset mountain goat migration shutdowns because CE's environment team had been informed that no work would be conducted beyond KM 43.8 during day shift. A road block was in place at KM 43.8 during both the sunrise and sunset shutdown periods, but the contractors had travelled to the intake before the closure and without a road block at KM 48 were able to drive through the corridor during both operational shut down periods.</p>									
Incident Witness: Elsie Phillips (CE goat gate attendant) and Anne Sutherland (Goat Monitor for SES)									
Were there any Potential Environmental impacts as a result of the incident? (e.g., surface contamination, storm sewers, or fish/wildlife mortalities)							Yes <input type="checkbox"/>	None Observed <input checked="" type="checkbox"/>	
If Yes, please describe:									
Has Wildlife Salvage Protocol been followed?							Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
If No, please explain:									
Water Quality Samples Collected?							Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
If yes, attach results of water quality analysis to report in table format. Include Laboratory analysis if completed. If No please explain:									
Have applicable photos and/or drawings been attached to the incident report?							Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
Incident Response Measures									



1. CE environment team investigated the reason for personnel passing through the corridor during shutdown period.
2. The personnel responsible have been reprimanded.

Actions to Prevent Incident Recurrence

Before the incident, these measures were in place:

1. Information about the daily shutdown hours was distributed to all foremen, superintendents and sub-contractors.
2. Road blocks were normally set up at both sides of the mountain goat migration corridor to prevent passage of contractor vehicles through the area during sunrise and sunset shutdown periods.

Since the incident, this additional measure will be implemented

1. CE Environment Team will ensure that road blocks are in place and manned at both sides of the corridor in advance of the shutdown period without exceptions.
2. All personnel, including sub-contractors, will be reminded of the daily operation shutdowns, and detailed information on the closure times to ensure this does not happen again.


Notification Record

Agency Reported to	Contact Information	Agency Contacted		Date Reported	Reported By	Method of Reporting
		Yes	No			
External						
MFLNRO	James Davies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email within 48 hours of the EIR being finalized.
BCEAO	Monica Perry Sheldon Foote Justin Carlson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email within 48 hours of the EIR being finalized.
Lil'wat Nation	Harriet VanWart Carrie Lester	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email within 48 hours of the EIR being finalized.
RAPP	Conservation Officer	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
EEP File# N/A	1-800-663-3456	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
DFO File# N/A	24hr reporting line	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Environment Canada	604-666-6100	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Canadian Coast Guard	604-666-6011	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Local Fire Rescue	911	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Internal						
Innergex	Julia Mancinelli	<input type="checkbox"/>	<input type="checkbox"/>			
IEM	Mike Champion – Stephanie Ellis –	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 25, 2016	Present on site during occurrence	




Notification Record						
Agency Reported to	Contact Information	Agency Contacted		Date Reported	Reported By	Method of Reporting
		Yes	No			
	Tom Hicks					
IE	Jenn McCash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 28, 2016	Julia Mancinelli	Email

Independent Environmental Monitor:

Tom Hicks	Lead Field IEM – Sartori Environmental Services		2015-11-26
Print Name	Position and Company	Signature	Date

Contractor's Manager:

Ian McKeachie	Environment Manager – CRT-ebc		2016-11-26
Print Name	Position and Company	Signature	Date